SHOUT
SHARE
IT

letins 272-284 OK 4/10/42

#280 - 45th Ann. Rpt. - 1933 } OK - RBS
#284 - 46th Ann. Rpt. - 1934 } 4/24/42

EXPERIMENT STATION LIBRARY

Bulletin 272 June, 1933

UNH LIBRARY
3 4600 00618 4813

RETAILING MILK IN LACONIA

By E. H. Rinear and
H. C. Moore

New Hampshire Agricultural Experiment Station
University of New Hampshire
Durham, N. H.

BIOSCI
S
B7
A21
no 272-
no. 284
PAS
A21
no. 272-284

SUMMARY

The returns for labor in retailing milk in Laconia averaged more than the net wholesale price of milk in this zone. Fifty-four producers shared this extra income.

The average price of milk sold by these producer-distributors was $.096 per quart. Their average current costs were slightly over $.004, and their average truck delivery costs, $.008, leaving an average net price from retailing of $.083 per quart. After deducting the average net wholesale price of $.041 per quart from the net retail price of $.083 per quart, the returns for labor in retailing amount to $.042 per quart.

The distance traveled daily by the 54 producers in retailing milk totaled 596 miles. The length of the city streets in Laconia and Lakeport is approximately 37 miles.

Numerous opportunities exist for combining the milk supply of several farms so that truck-delivery costs could be reduced and greater efficiency would result in the use of labor required for retailing.

Samples of Laconia's milk supply showed that approximately half of it was under 25,000 bacteria per cc., about three fourths under 100,000, and about one-fourth over 100,000.

Retailing Milk in Laconia

By E. H. RINEAR, Research Specialist in Marketing, and
H. C. MOORE, Assistant Dairy Husbandman

Because milk-marketing problems in Laconia are considered typical of many other communities in the State, a study of retail distribution was begun early in 1932. It was known that price cutting is commonly practiced and that the number of producer-distributors is large in proportion to the city population, thereby causing much duplication in travel, labor and expense. In view of these conditions the question has frequently been asked, "Are there more efficient methods of distribution that would yield larger returns to the producer?"

Method and Procedure:

To obtain data which would help to answer this question, a field survey was made of all producers who were performing part or all of the marketing services in retailing milk. Individual records of the previous year's business were taken on current costs, type of equipment, time required to bottle and to deliver, distance traveled, amount of milk sold daily, number of customers, prices received and other related information. This material was tabulated and cost ratios made for each producer and distributor under the following heads:

Current costs — Advertising, bad accounts, bottles, caps, depreciation of equipment, electricity, ice, interest on value of equipment, tickets and miscellaneous.

Delivery costs — A charge of six cents a mile was made for use of auto or horse and wagon for total distance traveled on the route. This does not include any charge for labor when delivering milk.

Returns for labor — This may be defined as the value of the producer's time in retailing compared to wholesaling milk, or the return for time required to wash bottles and to bottle and to deliver milk to customers. It was obtained by taking the average difference between the net price at the farm for Class I milk if sold through wholesale channels and the average net price received in retailing after current and delivery expenses had been deducted.

To determine quality of milk sold, samples of bottled milk were taken on the streets as the milk was being delivered and were plated for bacteria the same day in Durham. Total number of bacteria present in the samples was determined by following closely the technic described in "Standard Methods of Milk Analysis." The per cent of fat was established by the Babcock

method, and the per cent total solids was calculated from the percentage of fat and the lactometer reading, using Babcock's formula. The amount of sediment was found by passing a pint of milk through a cotton disc. Reports were returned to each producer regarding his sample.

General Picture:

Laconia is favorably located in the summer-resort section. Its resident population of 12,400 is greatly increased by out-of-state visitors during the summer months. This increased the demand for milk during a period of low-cost production.

Although 87 producers were licensed to sell milk in Laconia, only 65 were found who performed part or all of the distributing functions during the year, April 1, 1931, to April 1, 1932. The 65 sold 1,969,001 quarts of milk during the year at a total sales value of $177,299.40, or at an average price of nine cents a quart.

Many sold through more than one outlet so that the sales of all occurred in the following manner: 62 per cent retail; 15 per cent to stores; 3 per cent to hotels and restaurants; 16 per cent to dealer-distributors, and 4 per cent to surplus buyers. The fact that so small a part of the milk was sold as surplus shows these men do have a definite advantage over other types of marketing. In those instances where surplus milk was reported and not sold, it was used at home. At other times, two neighbors would exchange milk so as to keep a balance between their supply and demand. (See Table 1.)

The 65 producers may be divided into two principal groups: one of 54 producer-distributors who retailed over 74 per cent of their yearly supply direct to consumers, and another group of 11 producers who sold over 89 per cent to dealer-distributors. The marketing problems of the producer-distributors would be more numerous than those of the smaller group which sold almost entirely to dealers. While both groups perform part of the retail functions, such as washing bottles and bottling and delivering the milk, those selling retail usually have bottle losses, bad debts and many other selling problems not experienced by the others.

The 54 producer-distributors sold 1,626,930 quarts of milk during the year in the following ways: 74.2 per cent retail, 18.6 to stores, 3.8 to hotels and restaurants, 0.4 to dealers and 3 to surplus buyers. Although all of the men in this group retailed milk, over half of them or 29 delivered to stores, and seven sold surplus milk. During the months of June, July and August, sales averaged 5,117 quarts daily, or 846 quarts (16 per cent) more than the daily average of the fall, winter and spring months. This summer increase occurred in the following manner: 686 quarts retail, 129 to stores, 109 to hotels and restaurants, and 12 to dealers. The increased volume is due to the greater demand created by summer visitors. See Table 1.

On the other hand, the smaller group of 11 producers supplying dealers only, averaged fewer quarts daily during the summer months than during the balance of the year. The surplus sales of this group were over three times as great as those of the producer-distributors, and with very little seasonal variation. This group sold 342,071 quarts of milk during the year, 89 per cent going to dealer-distributors in Laconia.

TABLE 1.

Methods of distribution, amount and value of milk sold by 65 producers about Laconia during the period, April 1, 1931, to April 1, 1932. (Regardless of butterfat)

Methods of distribution	No. producers selling	Amount of milk sold*						Yearly sales (dollars)	Av. price per qt. (dollars)
		Summer—3 months		Fall, winter & spring—9 months		Total			
		Qts.	Per cent	Qts.	Per cent	Qts.	Per cent		
Producer-distributor: (54 in number)									
Retail	54	354,511	75.3	852,890	73.8	1,207,401	74.2	124,138.77	.103
Store	29	85,390	18.1	218,095	18.8	303,485	18.6	24,506.38	.081
Hotel and restaurant	12	23,112	4.9	38,838	3.4	61,950	3.8	6,048.09	.098
To dealer	2	2,292	.5	3,557	.3	5,849	.4	306.25	.052
Surplus	7	5,495	1.2	42,750	3.7	48,245	3.0	1,701.81	.035
Total	..	470,800	100.0	1,156,130	100.0	1,626,930	100.0	156,701.30	.096
Producer-to-dealer: (11 in number)									
To three dealers	11	66,460	83.8	238,980	90.9	305,440	89.3	18,796.20	.062
Retail	1	5,520	7.0			5,520	1.6	552.00	.100
Surplus	1	7,300	9.2	23,811	9.1	31,111	9.1	1,249.90	.040
Total	..	79,280	100.0	262,791	100.0	342,071	100.0	20,598.10	.060
Grand total	..	550,080	....	1,418,921	....	1,969,001	....	177,299.40	.090

* All cream and butter sales have been reduced to a milk basis and included as quarts of milk sold. There were 12,873 quarts of cream and 273 pounds of butter sold during the year, with a total sales value of $7,226.03 and $81.90, respectively.

The 65 farms included in this survey were operated with two exceptions by the owners. Of these 65, 20 were father-and-son, 2 mother-and-son, and 2 brother partnerships. Two farms were operated by hired men.

The amount of land in these farms averaged 135 acres and varied from 2 to 550 acres. The hayland per farm averaged 32 acres and ranged from none to 96 acres. An average of 1.5 acres of silage corn was grown per farm, with the acreage ranging from none to 8 acres. A small area — 2.3 acres per farm — consisted of sweet corn, oats, millet, potatoes, and other miscellaneous crops.

The number of dairy animals averaged 17 head per farm and ranged from 2 to 54 head; milch cows averaged 9 head and ranged from 1 to 26 in number; dry cows average 2.7 head and heifers 5.8 head per farm. Forty-one of these herds were of mixed breeds, 11 were Guernsey, 8 Holstein, 2 Jersey, 1 Ayrshire, and 1 Shorthorn. The average production of the 589 cows was 8.64 quarts daily.

Prices Received:

The price received by producers for milk varied greatly for the same type of sale, the greatest variation occurring in retail sales, with lesser amounts in store, hotel, restaurant and dealer sales. The summer business of this period averaged a trifle higher than the winter sales. See Table 2.

Numerous factors cause price to vary when milk is retailed from house to house. The 54 producer-distributors are in direct competition with each other in salesmanship, quality of milk, reputation, number of relatives and friends among their customers, and in length of time each has been retailing, and not all of them have these factors developed to the same degree.

When a producer-distributor loses one customer he may obtain another who will pay the same price as the one he lost, or he may have to underbid another distributor in order to dispose of his milk. This sort of shifting is continuous and tends to keep the market in a demoralized condition.

Table 2

**Average price per quart of milk and price range for different ways of selling regardless of butterfat claimed*

	Ways of selling				
	Retail	Store	Hotel and restaurant	Dealer	Surplus
Summer sales:	(dollars)	(dollars)	(dollars)	(dollars)	(dollars)
Number producers	54	24	6	11	5
Average price per quart..	.102	.080	.095	.058	.035
Price range per quart..	.06 to .13	.06 to .11	.07 to .12	.05 to .07	.03 to .04
Fall, winter and spring sales:					
Number producers	54	30	8	13	6
Average price per quart..	.098	.077	.080	.056	.036
Price range per quart..	.06 to .13	.06 to .10	.07 to .09	.05 to .08	.03 to .04

* Simple average.

Two classes of milk are commonly mentioned by the farmers — "regular" and Jersey or Guernsey. The usual price difference between these two classes was two cents a quart. This explains a good part of the price range given in Table 2 in selling retail or to the stores. When a detailed analysis is made of these prices according to the content, however, only a small relationship exists between the range of fat and the price of "regular" milk. Or expressed another way, the percentage of fat in "regular" milk varies from 3.2 up to 4.7 per cent with only a slight difference in the average retail price. The samples which ran over 4.7 averaged about one and one-half cents a quart more than those under this amount. This situation is to be expected when so many individual producers do their own bottling and selling.

Some producer-distributors advertise high-fat milk for the same price as their competitor's lower-fat product. On the whole the lack of accepted price standards for milk of varying fat content is one of the reasons for price demoralization in a local market.

"Surplus price" is a partial explanation of the large number of local producers distributing milk. This results from wholesale-market conditions and is made up by zones on a butterfat basis. The apparent great difference between this price and the going retail prices is what attracts the producer into the retail field. When the returns from wholesaling drop to low levels, more producers turn to retailing. This is especially true in sections where the farms are small and located close to a consuming market. Milk producers about Laconia are fortunate, however, in having one or more wholesale buyers in their local market to take the surplus milk away to other consuming centers.

Who Distributes Milk:

The farm activities of the producer-distributors are planned so that the owner generally performs the task of distributing milk, although in a number of instances among the father-and-son combinations, the son purchased the milk and took charge of the marketing end. This latter method apparently was working out very satisfactorily to all concerned, especially on the large farms where several hundred quarts were produced and sold daily. The large volume made it possible for one man to secure fair returns for his time.

When asked how much the milk route was worth, the owners showed by their answers how dependent they were on it in obtaining a livelihood. Time and again the answer was "It is not for sale" or "It is my living." The values placed on the retail milk routes varied from nothing up to $2.00 a quart. Actual route purchases of $1.00 a quart were reported. As to how the route was obtained, various answers were given. Nineteen purchased part or all of the route, 9 obtained it through friends and relatives, 24 said they "picked it up," and three definitely stated that they "stole it." These answers reflect the keen competition for customers which is continually going on.

The length of time each has been retailing milk varies from one to 47 years as follows: 33 less than 10 years, 14 from 10 to 20 years, and 7 over 27 years.

Table 3

Comparison of group — average equipment values according to number of quarts sold daily

	Equipment on 14 farms selling less than 50 quarts				Equipment on 31 farms selling from 50-99 quarts				Equipment on 9 farms selling over 100 quarts			
	No. farms	Total value (dollars)	Per cent	Group average	No. farms	Total value (dollars)	Per cent	Group average	No. farms	Total value (dollars)	Per cent	Group average
Aerators	2	12.30	3.4	.88	18	126.70	8.0	4.09	5	98.35	2.8	10.93
Bottling tanks	5	9.50	2.7	.68	21	131.35	8.3	4.24	9	149.75	4.2	16.64
Boilers	..	.....	....	....	4	24.00	1.5	.77	3	279.60	7.9	31.07
Bottles*	13	69.86	19.6	4.99	31	414.47	26.1	13.38	9	267.25	7.5	29.69
Brushes	12	6.85	1.9	.49	27	21.85	1.4	.70	5	6.90	.2	.77
Cans	2	2.50	.7	.18	13	72.81	4.6	2.35	2	14.00	.4	1.55
Carriers	13	13.50	3.8	.96	26	24.00	1.5	.77	6	3.50	.1	.39
Cases	8	13.90	3.9	.99	28	172.45	10.9	5.56	8	123.00	3.5	13.67
Refrigerators	9	167.50	46.9	11.97	28	128.00	8.1	4.13	8	1863.12	52.6	207.01
Separators	3	59.50	16.6	4.25	8	354.00	22.3	11.42	5	266.00	7.5	29.55
Sinks	1	2 00	.5	.14	8	16.75	1.0	.54	4	43.80	1.2	4.87
Sterilizers	..	.....	....	....	..	.....	....	....	1	330.00	9.3	36.67
Stoves	..	.....	....	....	5	24.00	1.5	.77	..	.....	....	.....
Washing machine, electric	..	.....	....	....	9	75.95	4.8	2.45	8	98.26	2.8	10.92
	..	357.41	100	25.53	..	1586.33	100	51.17	..	3543.53	100	393.73

* The customers furnished the bottles used by one distributor.

Equipment on Farms:

The equipment on these farms is generally not elaborate. The majority have limited the number of articles to absolute essentials. The present value of practically the same equipment on different farms ranges widely, however, due principally to age and purchase price. Some is new and some has been in use for ten years or longer. Purchases frequently were made at a public auction or through a "dicker."

Three divisions may be made of the farms with regard to milk rooms and equipment:

Eighteen producers use the kitchen in caring for the milk and usually have a cooling tank in a separate room or in the basement of the house. On these farms the equipment is scattered and requires more labor to care for the milk.

Twenty-five producers have remodelled a room in the house for a milk-room and this contains all the equipment.

Eleven producers have separate buildings equipped with steam boilers or stoves. Here all the equipment is located and all the operations are performed.

As the number of quarts sold daily increases, more expensive equipment with greater capacity is purchased to facilitate handling and caring for the milk. The men with a small volume have a surplus of time and can therefore manage to get along with less expensive equipment.

In Table 3 is shown the average value of equipment required by producer-distributors according to the number of quarts sold daily. Those selling less than 50 quarts daily have the lowest group average because they utilize much of the kitchen equipment. They do not have a boiler, extra stoves, or electric bottle washers. Their investment averages $25.53, which is half the amount of the group selling from 50 to 100 quarts daily and one-fifteenth that of the group selling over 100 quarts per day. To get the greatest return in each instance is simply a problem of properly combining equipment and labor.

When comparisons are made on the basis of sales of milk per dollar of equipment, the men distributing from 50 to 100 quarts have the best ratio. They sell $49.60 worth of milk for every dollar invested in equipment. See Table 4. As the volume of milk sold daily increases, there is a decided drop in the ratio for two main reasons. First, more equipment is purchased. Second, it is usually better equipment with greater capacity and therefore

TABLE 4

Comparison of equipment values and milk sales per dollar of equipment
(54 producer - distributors)

Quarts sold daily	Number producer-distributors	Yearly sales		Equipment values	Sales of milk per dollar of equipment (dollars)
		Amount (dollars)	Per cent	Total (dollars)	
Less than 50.....	14	12,984.67	8.3	357.41	36.33
50 - 99.....	31	78,708.19	50.2	1,587.33	49.58
Over 100	9	65,008.44	41.5	3,542.53	57.63
	54	156,701.30	100.0	5,487.27	28.56

more costly. Furthermore, capacity of the more expensive equipment is only partly used.

Some of the men selling over 100 quarts daily remarked that they could increase their daily volume without purchasing new equipment other than bottles. It is because of these conditions that overhead costs for equipment do not show a definite decline as volume of sales increases. Before a farmer enlarges his milkroom or purchases new equipment he could well afford to discuss the situation with his neighbors. It might be possible to combine the output of several so that the costs would be mutually reduced.

Table 5

Quality of milk delivered as shown by bacteria per cc., per cent fat, per cent total solids, and sediment

	Samples Taken March 19, 1932		Samples Taken August 16, 1932	
	No.	Per cent	No.	Per cent
Bacteria per cc.				
Under 10,000	17	26.58	7	12.29
10,000 - 25,000	19	29.69	14	24.56
25,000 - 50,000	9	14.07	14	24.56
50,000 - 100,000	5	7.82	7	12.29
Over 100,000	14	21.84	15	26.30
Total	64	100.00	57	100.00
Per cent fat				
Under 3.5	5 a	7.82	9 b	15.78
3.5 - 3.9	19	29.69	20	35.08
4.0 - 4.4	19	29.69	14	24.56
4.5 - 4.9	13	20.30	7	12.29
Over 5.0	8	12.50	7	12.29
Total	64	100.00	57	100.00
Per cent total solids				
Under 12.00	1 a	1.56	8 c	14.05
12.00 - 12.49	11	17.20	13	22.80
12.50 - 12.99	11	17.20	12	21.05
13.00 - 13.49	14	21.84	9	15.79
Over 13.50	27	42.20	15	26.31
Total	64	100.00	57	100.00
Sediment				
Good	14	21.87	21	36.83
Fair	32	50.00	26	45.62
Dirty	16	25.00	6	10.53
Extra dirty	2	3.13	4	7.02
Total	64	100.00	57	100.00

a. One below state standard.

b. Five below state standard.

c. Three below state standard.

Quality of Milk Sold:

The results of the quality study of the milk being sold in Laconia are given in Table 5.

In this study the samples were taken to represent winter and summer conditions. On March 19, 1932, the bacterial counts varied from 1,800 to 1,200,000 per cc. with less than 30 per cent of samples over 50,000. On August 16, 1932, the bacterial counts varied from 3,100 to 2,000,000 per cc., with only 12.29 per cent of samples under 10,000 per cc. and 38.59 per cent over 50,000.

Results of butterfat and total-solids tests showed the milk to be very high in both fat and solids. Of all samples taken only one showed indication of watering. This sample tested 2.9 per cent fat and 10.72 per cent total solids. The winter samples as a group ran much higher in fat and total solids than the summer samples, with 42.20 per cent of winter samples testing over 13.5 per cent total solids.

The sediment discs taken from these samples indicated a lack of care in producing and handling most of the milk. In the winter lot 21.87 per cent of samples rated good; in the summer lot the percentage was 36.83.

Table 6 discloses the percentage of producers selling milk of the five different quality classes. This table also brings out the point that the quality of the milk in the winter is much higher than in the summer. On the other hand, approximately one-half of the yearly supply based on these samples was under 25,000 bacteria per cc. and about one-fourth over 100,000. There was no relationship between the amount of the producer's milk-handling equipment and the quality of the milk he was selling in the market. As a group, the farmers selling under 50 quarts per day had fewer samples testing over 100,000 bacteria per cc.

TABLE 6

*Approximate quality of Laconia milk supply**

Bacteria count per cc. in thousands	Samples taken March 19, 1932			Samples taken August 16, 1932			Yearly supply†
	No.	Quarts sold daily	Per cent	No.	Quarts sold daily	Per cent	Per cent
Under 10 ..	17	1,125	22.3	5	447	9.1	19.1
10 to 25....	16	1,616	32.1	13	1,087	22.2	29.7
25 to 50....	6	710	14.1	12	1,132	23.1	16.3
50 to 80....	4	267	5.3	8	790	16.1	7.9
Over 100 ..	13	1,322	26.2	15	1,441	29.5	27.0
	56	5,040	100	53	4,897	100	100

* Several omissions occur in samples so that the total quarts of milk do not correspond with those previously presented.

† In determining the approximate quality of the yearly supply, the March samples of the quarts sold daily were weighted three times as compared with once for those taken in August.

Current Expenses:

When current costs were charted in reference to volume no definite relationship appeared. The majority kept these costs under three-fourths of a cent per quart regardless of volume.

Greater current costs have been the result of bad debt losses, high depreciation and interest charges on equipment, and unusually high ice or electricity bills in cooling the milk. Practically all of these items are matters of management and plans could be worked out for revising them. The current expense* of these 54 producer-distributors totaled $6,371.72 yearly, or an average cost of $.392 for every hundred quarts of milk sold. See Table 7.

TABLE 7

Current expenses of marketing 1,626,930 quarts of milk; 54 producer-distributors

Items	No. producers having expense	Current expense	
		Total (dollars)	Average per 100 quarts (dollars)
Advertising	6	239.00	.015
Bad accounts	24	1,622.50	.10
Bottles	49	895.24	.055
Caps	54	664.74	.041
Depreciation	49	735.36	.045
Electricity	52	252.01	.015
Ice	43	1,442.47	.089
Interest on equipment	53	243.04	.015
Tickets	29	188.36	.012
Miscellaneous	7	89.00	.005
Total	..	6,371.72	.392

Advertising is not carried on extensively. Only six producer-distributors reported any expense for this item. Printing the name of the distributor or farm on the cap was the method used most frequently. Newspapers, moving pictures and calendars were other agencies used. The amount spent for advertising varied from less than $10 to over $100 annually. The largest amount was spent by a producer who claimed to have a select trade. He was producing milk of high quality and obtained a price higher than the average.

---

* Depreciation costs were prorated according to the number of years each article of equipment had been in use and based on original cost. If the age of an article was over the limits given in the following schedule, no depreciation charge was made: cans, 2 years; cases, 3 years; aerators and bottling tanks, 10 years; electric refrigerators, 20 years; steam boilers and stoves, 25 years.

Interest at 5 per cent was charged on depreciated value of equipment.

Where ice was put up by the farmer the cost was figured at the following rates: labor 35 cents, team and wagon 50 cents, and truck $1.70 per hour.

Electricity used for lights was charged at 7 cents per kilowatt hour when using a 40-watt bulb. Bottles were valued at 7 cents each and tickets at 30 cents per thousand.

Less than half of the men claimed any losses due to bad debts, yet this item was larger than any of the others. The men were inclined to be lenient with customers who had little children and who were out of work. This was especially true for those who had a good past record, or who were relatives or close friends.

One of the most successful ways of guarding against bad accounts was explained by a producer. When asked by a prospective customer to supply milk, he delayed until the next day, in the meantime making inquiries regarding the man's credit record. If unfavorable, he gave notice the next day that he had no extra milk to sell. Through these tactics this producer claimed he never had lost a cent due to bad accounts.

Another practice was to sell tickets to customers and leave milk only in exchange for a ticket and empty bottle. A few distributors dropped customers when their bills reached $3, $5, $10, or $15. Customers were notified in some instances that no milk would be left except for cash after the bill totaled $5.00. Ten men stated they dropped customers if bills were not paid regularly and 10 others said they delivered regardless of whether the bills were paid.

Under these conditions, it is to be expected that bad accounts would vary greatly They ranged from $7.50 to $350 yearly and averaged 10 cents per hundred quarts for all producer-distributors.

Bottle losses were common, averaging for the group $895.24 yearly. It was generally agreed that the greater part of this was due to theft or to unreturned bottles. In a number of cases it was avoided by keeping a record on each customer and charging to his milk bill all bottles not returned.

Undoubtedly a local bottle exchange such as has been successful in other New Hampshire cities would reduce this expense. Its organization requires each distributor to register his milk bottle with the State.

Depreciation and interest charges on equipment are important items of expense and vary greatly for reasons given in the previous discussion on the amount and value of equipment used.

In this study the cost of cooling milk has been included in current expense. It is questionable whether the cost would be the same if these producers were wholesaling instead of retailing the milk. The cost of ice is the second largest item, amounting to $1,442.47 for the group, or an average of nine cents for every 100 quarts sold. A few producers fortunately situated cooled with running spring water.

Four producers were equipped with electrical systems. The yearly cost of operating these and other electrical apparatus used in caring for milk on these farms amounted to $217.56 yearly and has been included in the general electricity cost shown in Table 7.

Delivery Problem:

Practically all of the producers who distribute milk in Laconia are within a seven-mile radius of the city hall and 42 are within a four-mile zone, yet the distance traveled on the highways is considerably greater, as shown in Figure 1. The majority of these men travel over the four main highways leading into Laconia. There are instances where eight or more of them pass one another's farms en route to deliver milk, thereby multiplying the time and truck costs for delivery.

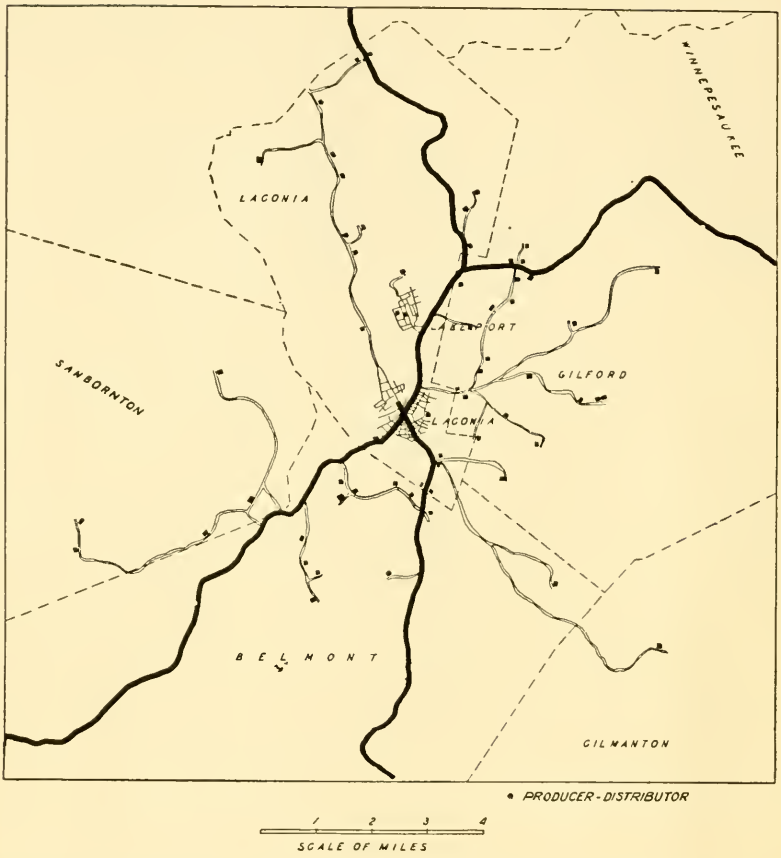

Figure 1. Map showing location of 65 producers supplying milk to Laconia. (Lakeport is a part of Laconia comprising Ward 6.)

The distance traveled daily by the 54 producer-distributors in delivering milk was divided as follows: from the farms to the first customers, 68 miles; length of milk routes, 359 miles; from the last customers and return to farms, 169 miles; total distance covered by all, 596 miles. The small total mileage to first customers is due to the fact that they were oftentimes located outside the city limits. The length of the city streets in Laconia is about 37 miles.

The delivery equipment used consisted of trucks, roadsters, sedans, touring cars, and horse-drawn vehicles. Four producers walked when making deliveries and at one place the customers called for the milk.

How much to allow for cost of operating delivery equipment (excluding labor) is a question. The costs given were mainly guesses and undoubtedly some items were forgotten. The average cost for 12 men who gave information on this subject was slightly over six cents per mile. Although several stated it cost more to operate their trucks, others operated for less because of the small amount invested in equipment.

On the basis of six cents a mile, delivery cost per quart varied directly with the amount of milk sold and the distance traveled daily. The producers selling between 50 and 100 quarts daily have the greatest range because the distance traveled daily varies from less than two miles up to forty miles. It would be possible apparently to combine the supply of several of those selling less than 100 quarts daily, thereby making savings in delivery costs. See Figure 2.

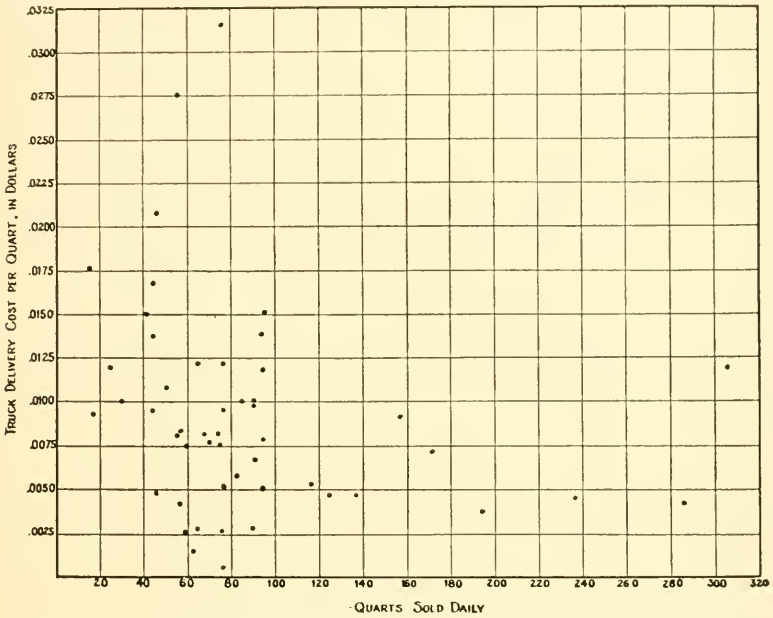

Figure 2. Distribution of truck delivery costs per quart (exclusive of labor) in relation to the number of quarts sold daily.

A further disadvantage of the distributor with small volume is shown in Table 8. Those selling less than 50 quarts daily traveled an average of 21 miles for every 100 quarts of milk sold; those selling over 100 quarts daily averaged less than 10 miles per 100 quarts. The average for all was 13.7 miles at an average cost of 80 cents per 100 quarts.

Labor distribution:

The time required by the 54 producer-distributors to perform all of the necessary tasks pertaining to retailing milk was 185 hours for every 100 quarts sold. This time was distributed for the group as follows: bottling 15.4, delivering 61.3, and washing 23.3 per cent. See Table 9.

The greater efficiency of the men selling over 100 quarts daily is an especially noticeable feature of this study. These larger producers used more and better labor-saving equipment (see Table 3) to make the most of their time. It is also possible that the large producers are naturally faster workers. The small producers had a surplus of time and were not forced to use it as efficiently.

Apparently the few men selling between 100 and 150 quarts daily have a better balance of labor and equipment in relation to volume, than any of

Table 8

*Comparison of delivery costs according to volume sold daily**

	Quarts sold daily					Total and average
	Less than 50	50 to 99	100 to 149	150 to 199	Over 200	
Number producers	14	31	3	3	3	54
Quarts sold yearly by each class	143,096	851,058	136,979	192,188	303,609	1,626,930
Miles traveled yearly by each class	27,557	127,776	10,840	20,075	31,390	217,638
Average miles traveled per 100 quarts sold..	19.3	15.0	7.9	10.4	10.3	13.4
Truck delivery costs per 100 quarts at 6c a mile†	$1.16	$.90	$.47	$.63	$.62	$.80

* Of those selling less than 50 quarts daily, three walked from house to house and in one instance the customers called for the milk. In the group selling from 50 to 100 quarts, one walked when delivering.

† The labor required to deliver milk is not included in the charge of 6 cents per mile for operating truck.

the other groups. It should be possible for several small producers to attain the same results if they combine their output. The greatest saving can be made in delivering milk, as about 61 per cent of their time is used in this way.

Returns for Labor:

So far this discussion has not considered any charge for the labor required to bottle, to deliver, to wash equipment, or to perform other tasks necessary in retailing milk. Yet it is this greater labor return from retailing which causes so many producers to take up distributing.

In this study the returns for labor are based on the difference between the net price received from retailing and the possible net wholesale price at the farm. The net retail price is the amount the farmer receives after current and delivery expenses have been deducted. The net wholesale price at the farm is the yearly average N.E.M.P.A. price after deducting association charges and freight and trucking expense.*

Table 9

Labor distribution according to daily sales of 54 producer-distributors — Based on 100 quarts of milk

Labor-distribution-hours per 100 quarts	Quarts sold daily					Average hours for all	Hours daily	
	Less than 50	50 to 99	100 to 149	150 to 199	Over 200		Total	Per cent
Bottling	1.15	.72	.28	.58	.49	.64	28.5	15.4
Delivering	3.89	2.98	1.50	1.92	1.73	2.55	113.7	61.3
Washing	1.27	1.28	.39	.53	.62	.97	43.2	23.3
Total	6.31	4.98	2.17	3.02	2.84	4.16	185.4	100.0

* The average New England Milk Producers Association (N.E.M.P.A.) price during the 12-month period ending April 1, 1932, for Class I milk to shippers in this zone, based on 3.7 per cent butterfat, was $2.021 per hundredweight after association charges were deducted. The cost of trucking the milk from the farm to railroad station in Laconia was estimated at 20 cents per hundredweight.

On this basis the average net retail price for the 54 producer-distributors was $.0828 per quart. The average net wholesale price was $.0407 per quart, leaving an average labor return from retailing of $.0421 per quart. Thus the return for labor alone is more than the wholesale price. See Table 10. The yearly return for labor in retailing amounted to $68,588.

It was pointed out in previous discussions of Table 1 that a very small part of the milk was sold as surplus. This would justify using the Class I price. If a 20 per cent surplus were figured, however, this would lower the net wholesale price at the farm and tend to make the margin of returns for labor in retailing even greater than appears in the preceding paragraph.

If all of the milk had to be sold on a wholesale basis, some of the farms would not be operated. The returns from labor in retailing enables many of these producer-distributors to operate a small place. Furthermore, they have a few alternatives to choose from in other types of farming.

Those selling less than 100 quarts daily received the smallest return per hour for their labor in retailing. The average return of the group selling less than 50 quarts daily was $.491 per hour; for those distributing between 50 and 100 quarts, $.738 per hour. Those having greater volumes were able on the other hand to use their time to better advantage, receiving from $1.13 to $2.00 per hour. The average return of all 54 producer-distributors was $.938 per hour. See Table 8 and Figure 3. If two or more of the men in the groups selling a small volume daily would combine their output, they should receive a greater labor return.

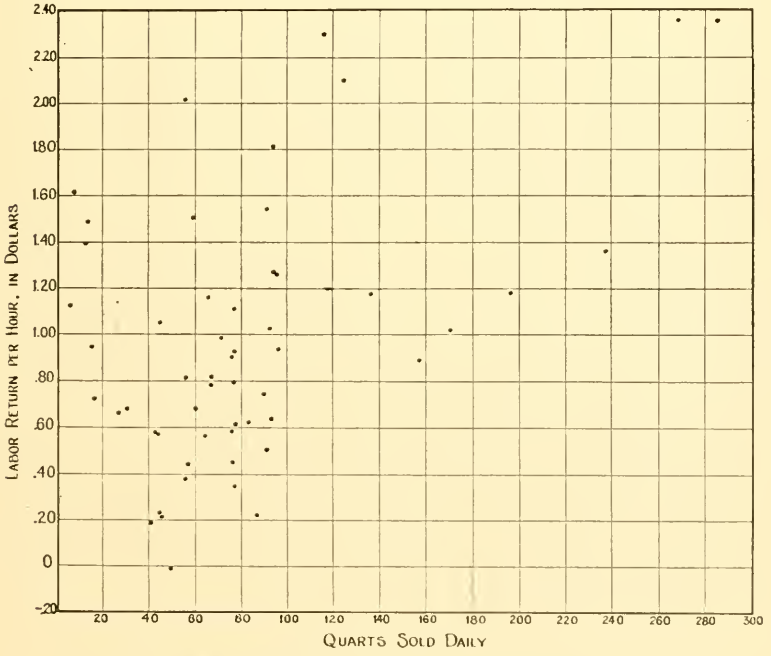

Figure 3. Varying labor returns from retailing milk in relation to the number of quarts sold daily.

The variation in price received for milk has been shown in Table 2. A high or low average for the yearly sales can affect the labor returns. The same is true of high or low delivery costs. If a farmer is unfortunate in having a combination of low price and high delivery cost due principally to small volume, he is certain not to receive much for his time in retailing milk. In one instance, a producer lost one-tenth of a cent on every quart retailed, considering the price he could have received wholesale. His yearly sales were $18.25 less than if he had sold wholesale and he received no return for his labor in retailing.

It would not be correct to state that all of the men selling less than 100 quarts daily could improve their labor returns if they co-operated with their neighbor and combined supplies. Four of them having the smallest volume received over $1.00 per hour for the time spent retailing milk. Three, however, walked and carried the milk to the customers who were a few doors away, and the fourth was even more fortunate as his customers called for the milk. It is the men who have a small volume and live a considerable distance from Laconia who can afford to combine milk output in order to reduce time and delivery expense.

In the group selling less than 50 quarts daily, two were over six miles from Laconia and more than half were over two miles. Of those distributing from 50 to 100 quarts daily, about three-fourths were beyond the two-mile zone, three were between six and eight miles and two between eight and ten miles. Under these conditions, the distribution costs can be reduced as shown by previous analysis.

Conclusions:

The previous discussion has pointed to the need for fewer distributors who sell larger daily volumes, if savings in cost of retailing are to be made. Since the returns from retailing milk are an important source of the farm income, any plan for reducing costs could not be successfully applied if it materially lowered these returns.

At the present time there is some evidence of producers combining supplies. Some farmers have purchased bottled milk outright from their neighbors and delivered it entirely on their own responsibility. The extra amount increased their daily volume and enabled them to obtain a greater return for their time. It is possible for more men to take over the supply of the small producers, so that mutual savings will result. The greatest saving would come to the small producers who travel a long distance.

Ideal conditions exist for combining the supplies of two or more producers in some neighborhoods. Quality of the milk is about the same from each farm, methods of sale and price received are nearly identical, and the dispositions of these neighbors are of the type which builds successful co-operatives. Other situations are not ideal and to attempt a neighborhood co-operative for retailing milk would be impractical. This does not imply that unfavorable conditions cannot be changed.

Three plans are suggested for reducing distribution costs:

No. 1. Under the ideal conditions described in the preceding paragraph, a small group of producers could form a neighborhood co-operative for delivering milk, each one continuing to bottle milk, but one man collecting from the farms and doing all of the distributing. The latter would receive a definite amount per quart for delivering and for recording and prorating the returns.

Each producer would receive an original rating based on his percentage of the total volume sold at time of forming the association. This rating could be revised if the group desired.

The milk sales would be pooled weekly and returns made to each producer after deducting the fixed delivery charge, bad debts, and bottles lost or broken on the route.

The chief advantage of this plan is that all producers would share equally in the savings through more economical distribution.

No. 2. One producer would purchase all of the bottled milk from the neighbors on his road or immediate vicinity. He would also buy out the milk routes of each, thereby increasing his volume several times.

The difficulty with this plan would be the variable butterfat and quality factors of the milk. If all kept the same breed of cows, the variation in butterfat would be negligible. It would be inconvenient to keep the milk separate for each farm and continue to give each customer the same milk, unless each producer had his own printed bottle caps. Even then some of the trade would probably be lost because the personal relationships with the producers would be broken.

It would be difficult to set a selling price which would invite all producers to stop delivering. As has been previously pointed out, there is much variation in their returns for labor. Those receiving small returns for their time in delivering would be more willing to make a change than those obtaining high returns.

There are many other factors to be considered, such as size of farm, possible increases in production, and alternative use of extra time. Under this plan, however, the one who took on the extra volume would receive greater returns for his time and use of his truck.

Plan 3. Two neighbors might alternate weekly in delivering the milk from both farms, thereby cutting delivery costs in half. Each producer would continue to be responsible for his own customers, credits, and bottle losses. Such an arrangement would have definite advantages where the men are honest and of equal ability.

Table 10

Returns for labor in retailing milk according to daily sales of 54 producer-distributors

	Quarts sold daily					Totals	Average per quart	Average per hour
	Less than 50	50 to 99	100 to 149	150 to 199	Over 200			
Quarts sold yearly	143,096	851,058	136,979	192,188	303,609	1,626,930		
	(dollars)	(dollars)	(dollars)	(dollars)	(dollars)	(dollars)	(dollars)	(dollars)
Total sales value.....	12,984.67	78,708.19	14,962.46	18,634.66	31,411.32	156,701.30	.0963	
Net sales value*	10,558.59	66,922.96	13,623.98	16,297.40	27,355.16	134,758.09	.0828	
N.E.M.P.A. net wholesale value†	5,962.92	34,384.64	6,009.50	7,426.77	12,385.93	66,169.76	.0407	
Yearly labor returns from retailing	4,595.67	32,538.32	7,614.48	8,870.63	14,969.23	68,588.33		
Yearly hours labor in retailing	9,351.30	44,093.81	4,369.05	7,840.20	7,460.60	73,114.96		
Labor return per quart	.0321	.0382	.0556	.0462	.0493		.0421	
Labor return per hour	.491	.738	1.743	1.131	2.006			.938

* After current and delivery expense have been deducted.

† In determining the N.E.M.P.A. price for each producer, adjustments were made on the basis of average butterfat. Seven butterfat records were made available through the courtesy of the Laconia Board of Health.

PAS
630.72
N532
no.272-284